Developing a Prioritization Protocol for Munitions Response Sites

Meeting of Federal Agencies
December 4, 2002

Background

Congressional Requirement

- Section 311 of FY02 Defense Authorization Act
  - Develop, in consultation with States and Indian Tribes, a proposed protocol for assigning to each “defense site” a relative priority for response activities related to unexploded ordnance, discarded military munitions, and munitions constituents
    - “Defense sites” are locations not on an operational range where a munitions response is needed
  - Issue proposed protocol for public comment by November 30, 2002
  - Issue final protocol
  - Apply to sites in munitions response site inventories

DoD Objectives

- Develop, in consultation with EPA, States, and Indian Tribes, a prioritization protocol for activities at munitions response sites
  - The protocol should:
    - Use consistent factors, terminology and definitions
    - Address safety, environmental hazards, and other pertinent management factors
    - Allow for consistent application
  - Provide a proposed prioritization protocol for public comment by November 30, 2002
- Develop and provide training on the final protocol
- Apply to munitions response sites in the initial inventory required by May 31, 2003

Factors for Consideration

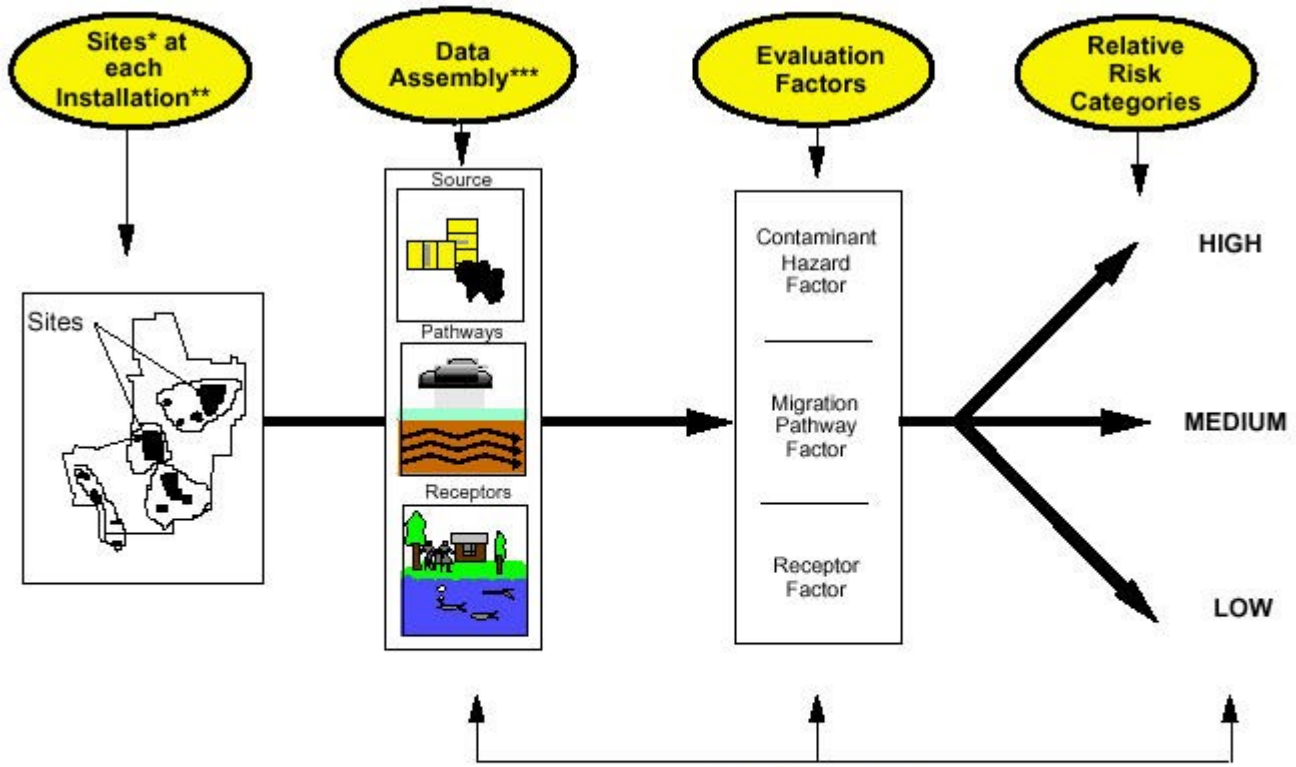
- In assigning a relative priority to a site, DoD is to, “primarily consider factors relating to safety and environmental hazard potential,” such as* :
  - Presence of known or suspected unexploded ordnance, discarded military munitions, or munitions constituents
  - Types of munitions or munitions constituents
  - Presence/effectiveness of public access controls
  - Potential/evidence of direct human contact
  - Status of any response actions
  - Date for transfer from military control
  - Extent of documented incidents
  - Potential for drinking water contamination or release into the air
  - Potential for damage to natural resources

*Factors are paraprhrased for brevity.

Current DoD Policy – Priority Setting and Sequencing

- DERP Management Guidance, Section 16, Priority setting and sequencing
  - Prioritization and sequencing of environmental restoration activities is accomplished using the frameworks described in the *DoD Relative-Risk Site Evaluation (RRSE) Primer* and the *Risk Assessment Code (RAC),* other risk information, and other management factors
    - In prioritizing and sequencing environmental restoration activities, other risk information and other management factors do not influence the high, medium, or low RRSE or RAC score, or risk assessment results, but may influence the site's priority for funding
    - Generally sites that present a greater relative-risk to human health, safety, or the environment will be addressed before sites that present a lesser risk

Relative-Risk Site Evaluation Concept Summary



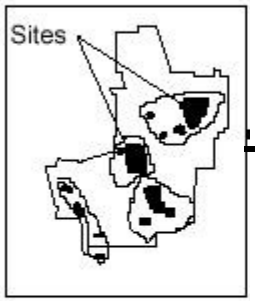
Risk Assessment Code Concept Summary

Sites at each installation, property, range

Data assembly

Evaluation factors

Separate categories



Type of Ordnance

- Conventional
- Pyrotechnics
- Bulk high explosives
- Chemical warfare materiel and radiological weapons

Area, Extent, & Accessibility

- Locations
- Distance to nearest inhabited structure
- Number of buildings in 2 mile radius
- Types of Buildings
- Accessibility of site
- Site dynamics

Hazard severity value

Hazard probability value

RAC 1

RAC 2

RAC 3

RAC 4

RAC 5

Current DoD Priority Setting and Sequencing Concept Summary

Sites at each installation, property, range

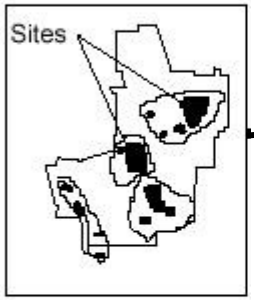
Data assembly

Evaluation factors

Evaluation "scores"

Priority and sequencing considerations

Funding sequence



Relative Risk

- Source
- Pathway
- Receptor

- Contaminant hazard factor
- Migration pathway factor
- Receptor factor

High

Medium

Low

Risk Assessment Code

- Type of ordnance
- Area, extent, accessibility

- Hazard severity
- Hazard probability

RAC 1

RAC 2

RAC 3

RAC 4

RAC 5

Stakeholder concerns

Reasonably anticipated future land use

Implementation and execution considerations

The availability of technology to detect, discriminate, recover, and destroy the military munitions

Standing commitments

Community reuse requirements

Program goals and initiatives

Cultural, social and economic factors

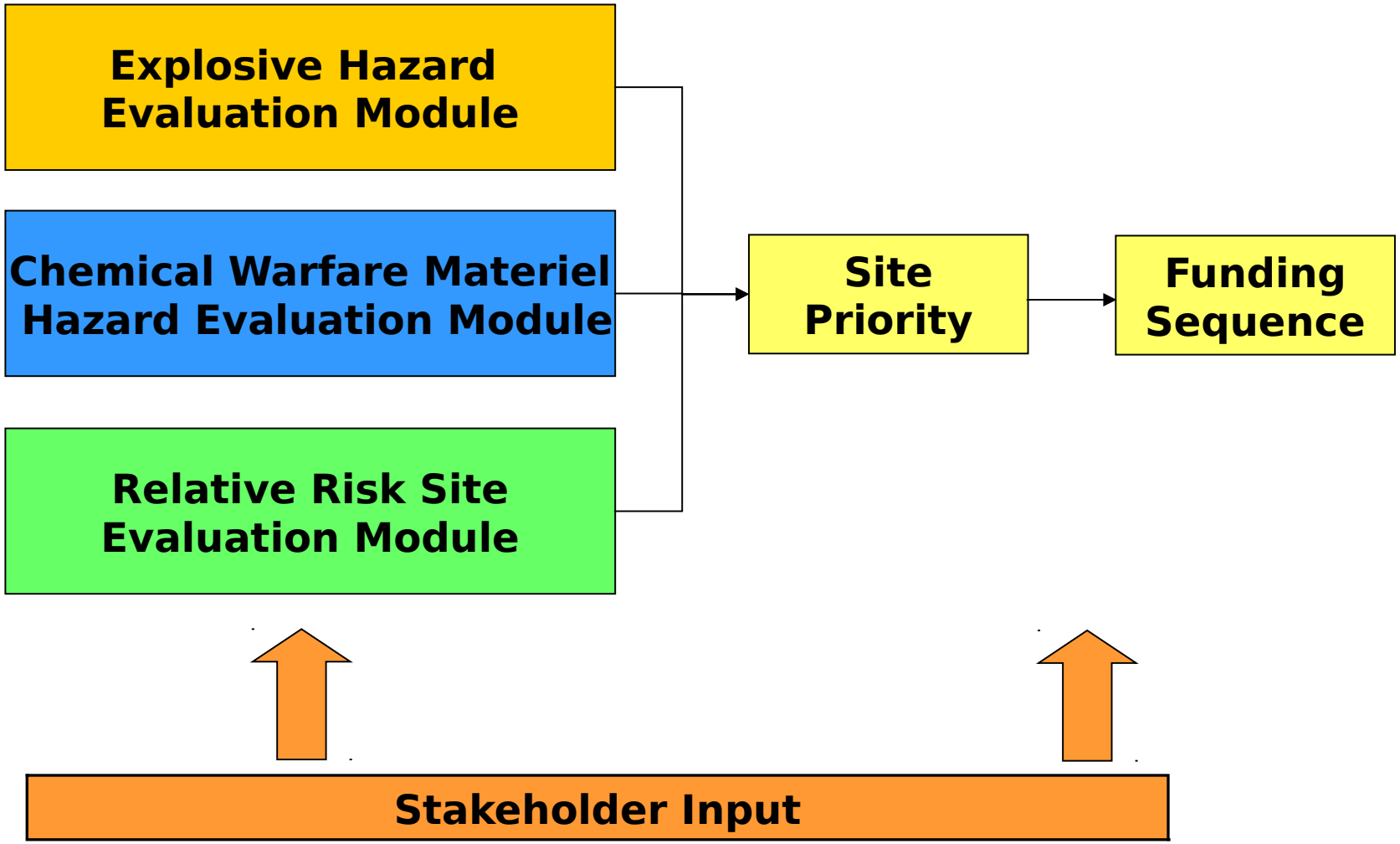
Others

Funded

Unfunded

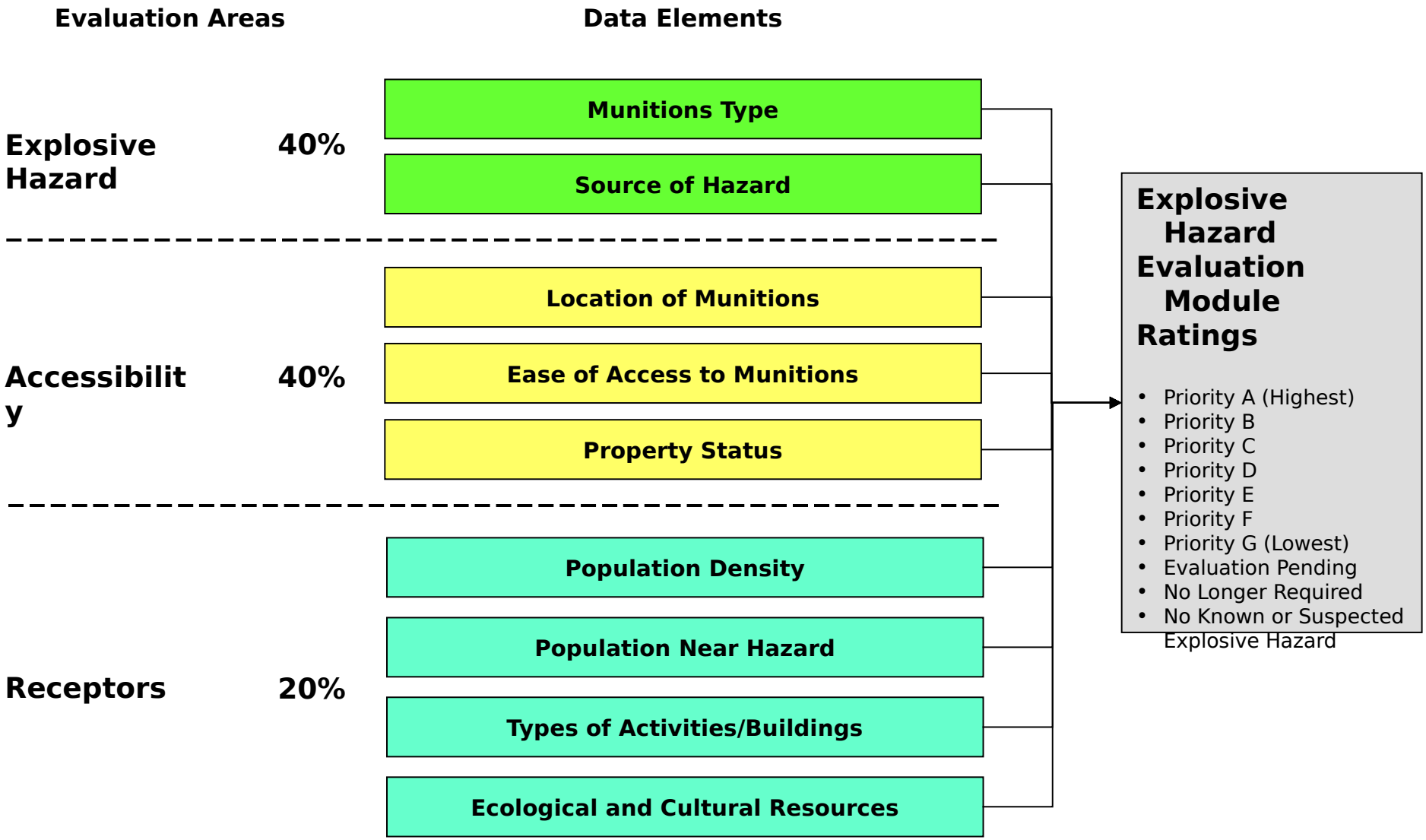
Concept for Overall Protocol Structure

Overall Protocol Structure



Explosive Hazard Evaluation Module

Explosive Hazard Evaluation (EHE)



Explosive Hazard Evaluation (EHE)

Explosive Hazard

Munitions Type 30 (14)

• Sensitive	30
• High explosive (used or damaged)	25
• Pyrotechnic	20
• High explosives (unused)	15
• Propellant	15
• Bulk HE, pyrotechnics, or propellant	10
• Practice	5
• Riot control	3
• Small arms	2
• Evidence of no munitions	0

Source of Hazard 10 (16)

• Former ranges	10
• Former OB/OD units	7
• Former ranges (practice munitions only)	6
• Burial pits	5
• Sites w/former industrial operating facilities	
• Former Firing points	4
• Former missile or ADA emplacements	2
• Former storage or transfer sites	2
• Former small arms range	1
• Evidence of no munitions	0

Accessibility

Location of Munitions 25 (17,18)

• Confirmed Surface	25
• Confirmed Subsurface, active	20
• Confirmed Subsurface, stable	15
• Suspected (physical evidence)	10
• Suspected (historical evidence)	5
• Subsurface, physical constraint	2
• Small arms (regardless of location)	
• Evidence of no munitions	0

Ease of Access 10 (19)

• Onsite pop./no barrier	10
• Barrier is incomplete	8
• Barrier (no guard); or guard (no barrier)	6
• Isolated site	4
• Guard and barrier	2
• 24-hour surveillance	0

1

Status of Property 5 (20)

• Non-DoD control	5
• Scheduled for transfer from DoD control	3
• DoD or State NG control	0

Explosive Hazard Evaluation Module Ratings

Total Score from all elements

• Priority A (Highest)	>92
• Priority B	82 - 91
• Priority C	71 - 81
• Priority D	60 - 70
• Priority E	48 - 59
• Priority F	38 - 47
• Priority G (Lowest)	0 - 37

- Evaluation Pending
- No Longer Required
- No Known or Suspected Explosive Hazard

Receptors

Population Density (people/sq mi) 5 (21)

• > 500	5
• 100 - 500	3
• < 100	1

Number in () is page number with definition

Population near Hazard 5 (21)

• 26 or more buildings	5
• 16 to 25	4
• 11 to 15	3
• 6 to 10	2
• 1 to 5	1
• 0	0

Types of Activities/Buildings 5 (21,22)

• Residential, educational, etc.	5
• Industrial, warehouse, etc.	4
• Agricultural, forestry, subsistence	3
• Recreation (hiking, hunting, etc.)	2
• No known or recurring activities	

Ecological or Cultural Resources 5 (23)

• Ecological and Cultural	5
• Ecological	3
• Cultural	3
• None	0

EHE Definitions – Explosive Hazard

- Munitions Type
  - **Sensitive** – Used munitions that are most likely to function upon any interaction with exposed personnel; and hand grenades, whether used or unused. Sensitive used munitions include, but are not limited to: fuzes, sub-munitions, clustered munitions (bomblets), 40mm grenades, high explosive anti-tank (HEAT) munitions, and munitions containing white phosphorous filler (except practice rounds).
  - **High explosive (used or damaged)** – Used munitions containing a high explosive filler (e.g., RDX, Comp B) and munitions that have damaged by open burning (OB) or open detonation (OD)
  - **Pyrotechnic** – Used or unused munitions (e.g., flares, signals, simulators, smoke grenades) containing pyrotechnic fillers other than white phosphorous.
  - **High explosive (unused)** – Unused munitions containing a high explosive filler (e.g., RDX, Comp B)
  - **Propellant** – Munitions or munition components (e.g., rocket motors) containing only a propellant (e.g., single, double, triple-based propellant).
  - **Bulk high explosives (HE), pyrotechnics, or propellant** – Bulk HE - Demolition charges (e.g., C4 blocks) or concentrated mixtures in media, such that the media is explosive (e.g.,explosive soil). Bulk pyrotechnic - Pyrotechnic material not contained in a munition. Bulk propellant - Propellant (e.g., single, double, triple-based propellant) not contained in a munition.
  - **Practice** – Munitions that are inert loaded and that may contain only a spotting charge (e.g., a small charge of white phosphorus or black powder used for marking points of impact). In most instances, practice munitions, which are used because they are both less hazardous and less expensive than "service" munitions, simulate a service round in weight, configuration, and ballistic properties. While a practice muntions' propelling charge is live, the projectile may be inert, or have a small quantity of explosive filler, such as black powder, to serve as a spotting charge.
  - **Riot control** – Munitions containing riot control agent (e.g., tear gas).
  - **Small arms** – Unused small arms (.50 caliber, and below) ammunition. There must be evidence that no other type of munitions (e.g., grenades) were used at the site to classify as small arms.

EHE Definitions – Explosive Hazard

- Munitions Type
  - **Evidence of no munitions** – Following investigation, the site has no physical evidence (e.g., munitions fragments or munitions constituents), of munitions, nor any historical (e.g., written documentation, interview results) evidence indicating that munitions (e.g., UXO, discarded munitions) are present.

EHE Definitions – Explosive Hazard

- Source of Hazard
  - **Former ranges** — Areas where live-fire training or testing were conducted, but that were either closed by decision (formal) or that were put to a use incompatible with munitions use or range activity. Such areas may include: impact or target areas and their associated buffer and safety zones, firing points, and live-fire maneuver areas.
  - **Former open burning/open demolition (OB/OD) units** — Areas where munitions and propellants were burned or detonated for the purpose of treatment or disposal.
  - **Former ranges (practice munitions only)** – Former ranges on which only practice munitions were used.
  - **Burial pits** — Areas where munitions or munitions-related debris were buried or dumped as means of disposal.
  - **Sites containing former industrial operating facilities** — Sites containing former munitions manufacturing or demilitarization facilities.
  - **Former firing points** — The firing point, when considered as a separate site, and areas adjacent to it.
  - **Former missile defense or ADA emplacements** — Emplacement and area adjacent to a former missile defense or air defense artillery (ADA) emplacement that were located around critical facilities and not associated with a range.
  - **Former storage areas or transfer sites** – Areas where munitions were stored or handled for transfer between different modes (e.g., rail to truck, truck to weapon system) of transportation.
  - **Former small arms ranges** — Ranges where only small arms (.50 caliber and below) were used. There must be evidence that no other type of munitions (e.g., grenades) were used at the site to classify as a small arms range.
  - **Evidence of no munitions** – Following investigation, there is no physical evidence (e.g., munitions fragments or munitions constituents), of munitions nor any historical (e.g., written documentation, interview results) evidence indicating that munitions (e.g., UXO, discarded munitions) are present.

EHE Definitions – Accessibility

- Location of Munitions
  - **Confirmed surface** — Physical presence or a confirmed incident report or accident report of munitions (e.g., UXO, discarded or abandoned munitions) on the surface or exposed, in part or whole. (Munitions exposed in part or whole by daily tidal changes should be considered as confirmed surface munitions.)
  - **Confirmed subsurface, active** —
    - Physical evidence or geophysical site-characterization data indicating that subsurface munitions (e.g., UXO, discarded or abandoned munitions) or fully submerged (in less than 120 feet of water) munitions exist at the site; or a confirmed incident report or accident report indicating that munitions have been exposed by known intrusive activities.
    - Active indicates that the site's geological conditions are likely to cause munitions to be exposed in the future by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave) or that on-going intrusive activities (e.g., plowing, construction, commercial fishing) are likely to expose munitions.
  - **Confirmed subsurface, stable** —
    - Physical evidence or geophysical site-characterization data indicating that subsurface munitions (e.g., UXO, discarded or abandoned munitions) or fully submerged (in less than 120 feet of water) munitions exist at the site; or a confirmed incident or accident report indicating that munitions have been exposed by known intrusive activities.
    - Stable indicates that the site's geological conditions are not likely to cause munitions to be exposed by naturally occurring phenomena, or that intrusive activities are not likely to either occur, or to cause munitions to be exposed.
  - **Suspected (physical evidence)** — Physical evidence (e.g., munitions fragments or non-explosive components), other than the physical presence of a munition, that suggests the presence of munitions.

EHE Definitions – Accessibility

- Location of Munitions
  - **Suspected (historical evidence)** — Any historical (e.g., written documentation, interview results) evidence (includes records on the use of a range or OB/OD area or unconfirmed evidence of buried munitions) indicating that munitions may have been used, discarded, or treated at the site. Does not include evidence that munitions were merely present (e.g., stored or handled) at the site.
  - **Subsurface, physical constraint** — Evidence that subsurface or fully submerged munitions may exist, but that they cannot be accessed due to a physical constraint (e.g, pavement, water over 120 feet)
  - **Small arms (regardless of location)** – The confirmed or suspected presence of small arms (.50 caliber and below) regardless of geological features. There must be evidence that no other types of munitions (e.g., grenades) were used at the site to classify as small arms.
  - **Evidence of no munitions** – Following investigation, there is no physical evidence (e.g., munitions fragments or munitions constituents), of munitions nor any historical (e.g., written documentation, interview results) evidence indicating that munitions (e.g., UXO, discarded munitions) are present.

EHE Definitions – Accessibility

- Ease of Access
  - **On-site population or no barrier**— No physical means of controlling access or entry to site or presence of an on-site resident population
  - **Barrier is incomplete** — Barrier does not completely surround the site or is in disrepair. Such areas would include water areas with restrictions annotated on government nautical charts that are without signage indicating access restrictions (e.g., water restrictions)
  - **Barrier (no guard) or guard (no barrier)** — A barrier is in place, but no manned entry controls
    (e.g., security guards or surveillance systems) are employed, or areas at which manned entry controls are employed, but no barrier is in place. Such areas would include water areas (e.g., lakes, rivers, bays, oceans etc.) with water restrictions annoted on nautical charts, but no patrols or guards.
  - **Isolated site** — A site, with or without a barrier, where there is minimal access because the site is in a remote location with limited access
  - **Guard and barrier** — Manned entry controls and barriers are employed
  - **24-hour surveillance** — A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel continuously monitors and controls entry) and a means to control entry at all times through the gates or other entrances (e.g., an attendant, television monitors, locked entrances or controlled roadway access to the area)
  - **Barrier:** means either natural obstacles (e.g., difficult terrain, dense vegetation, water) or man-made obstacles (e.g., fencing) that prevent easy access to the area or entry to the site

EHE Definitions – Accessibility

- Property status
  - **Non-DoD control** — Site is not owned or managed by a DoD. (Examples include: Indian lands, land managed by other Federal agencies, state lands, privately owned land)
  - **Scheduled for transfer from DoD control** – DoD property that DoD plans to transfer to non-DoD control within 3 years
  - **DoD control** — Site is owned or managed by DoD or a State National Guard on a 24 hour a day basis

EHE Definitions – Receptors

- Population density
  - The population density (people/square mile) is calculated using the U.S. Census Bureau's latest data for the county population. The county area is expressed in square miles. If the site is located in more than one county, the largest population density is used. If the site is within or borders on city limits, the population density of the city should be used instead of the county population density
- Population near hazard (inhabited buildings within a 2-mile radius)
  - The population near the hazard is considered by counting the number of inhabited buildings within a 2-mile radius, extending out from the boundary of the munitions response site.
- Types of activities/buildings
  - **Residential, educational, etc.** — Inhabited buildings and activities within a 2-mile radius of the boundary of the military munitions response area or site are used for any of the following: residential, educational, child care, hospitals, hotels, commercial, shopping centers, play grounds, community gathering areas, religious sites, or critical assets (e.g., fire and rescue, police stations, dams).
  - **Industrial, warehousing, etc.** — Buildings or activities within a 2-mile radius of the boundary of the military munitions response area or site are used for industrial or warehousing purposes.
  - **Agricultural, forestry, substinence** — Buildings, land masses, or activities within a 2-mile radius of the boundary of the military munitions response area or site are used for agriculture, forestry, or subsistence hunting, fishing, or gathering.

Inhabited Buildings – Structures (e.g., schools, churches, residences, aircraft passenger terminals, stores, shops, factories, hospitals, theaters, etc.) other than DoD munitions-related buildings, routinely occupied for any portion of the day, both within and outside DoD establishments.

EHE Definitions – Receptors

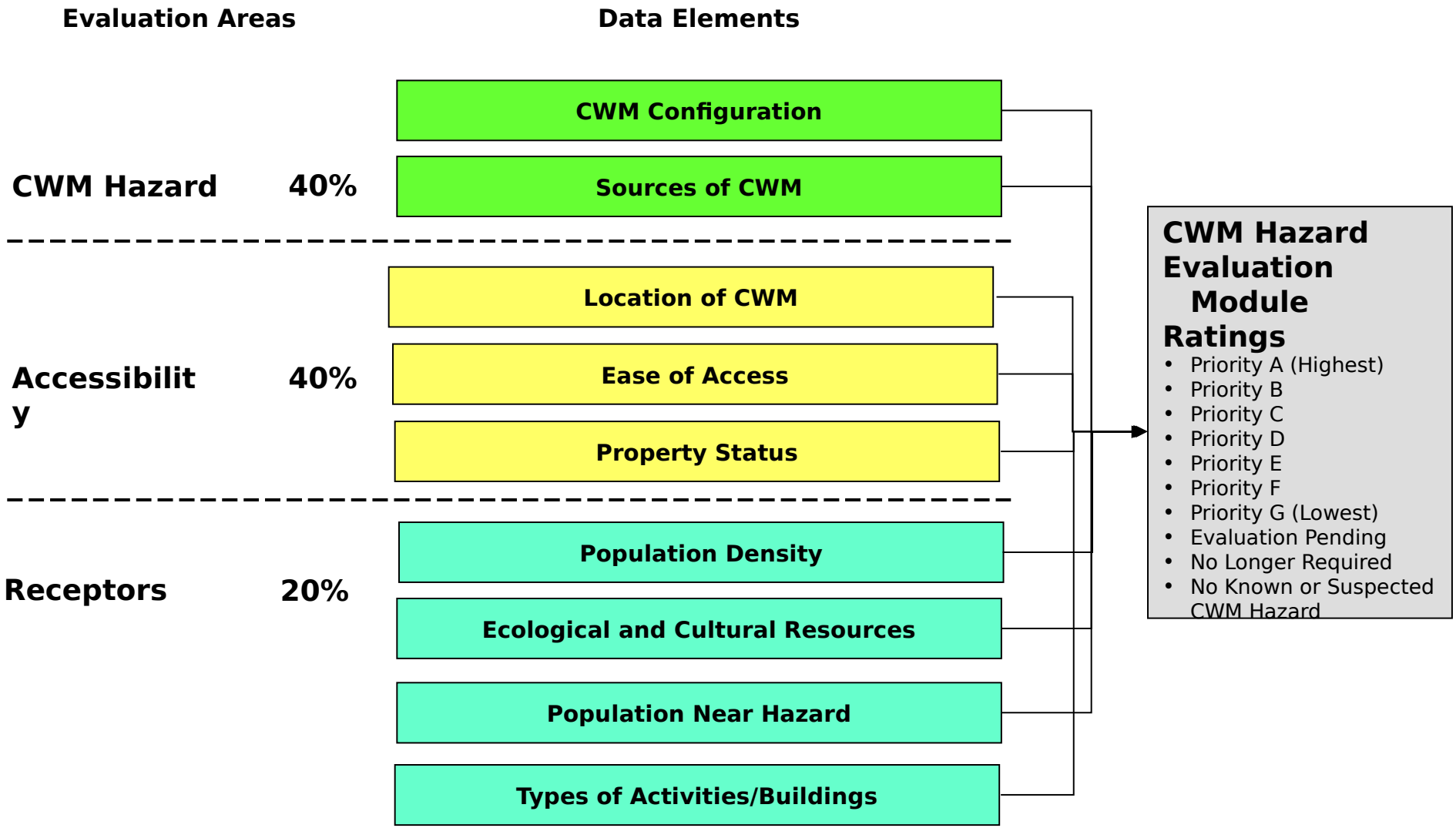
- **Recreational or thoroughfare (e.g., hiking, hunting)** —Buildings, land masses, or activities within a 2-mile radius of the boundary of the military munitions response area or site are used for recreational purposes, such as hiking, boating, or hunting or are used as thoroughfares.
- **No known or recurring activities** —There are no inhabited buildings within a 2-mile distance, extending out from the boundary of the military munitions response area or site or no known recurring activities occur at the site.

EHE Definitions – Receptors

- Ecological and Cultural Resources
  - **Ecological resources** – Includes:
    - **Threatened and endangered species/critical habitat** – A recognized threatened or endangered species is present or the site is designated as critical habitat for such a species
    - **Sensitive ecosystems** – e.g., wetland, breeding grounds
    - **Natural resources** – Recognized and identified natural (e.g., mineral deposits) resources
  - **Cultural resources** – Recognized cultural, religious, and historical sites (includes Native American religious sites and areas used for subsistence)

Chemical Warfare Materiel Hazard Evaluation Module

CWM Hazard Evaluation (CHE)



CWM Hazard Evaluation (CHE)

CWM Hazard Evaluation Module Ratings

CWM Hazard

CWM Configuration 30 (27)

- Chemical, explosive configuration (used or damaged) 30
- CWM mixed with UXO 25
- Chemical, explosive configuration (unused) 20
- Bulk CWM (containerized or in non-explosively configured munition) 15
- ~~CAIS (chemical agent identification sets)~~ 10
- Evic… 0

Sources of CWM 10 (28)

Live-fire with agent filler	10
Burial site with unused CWM Munitions, damaged	10
Discarded or abandoned CWM Munitions, surface	10
Burial site with unused CWM Munitions, undamaged	
Production facility	3
RDT&E (includes research facilities, static testing)	2
Individual soldier training (includes liquid agent training, decontamination training)	2
Storage of CWM	1
Transfer operations	1
Evidence of no CWM	0

Total Score from all elements

- Priority A (Highest) >92
- Priority B 82 - 91
- Priority C 71 - 81
- Priority D 60 - 70
- Priority E 48 - 59
- Priority F 38 - 47
- Priority G (Lowest) 0 - 37

Accessibility

Location of CWM 25 (29,30)

Confirmed Surface	25
Confirmed Subsurface, active	20
Confirmed Subsurface, stable	15
Suspected (physical evidence)	10
Suspected (historical evidence)	5
Subsurface, physical constraint	2
Evidence of no CWM	0

Ease of Access 10 (31)

Onsite pop./no barrier	10
Barrier is incomplete	8
Barrier (no guard); or guard (no barrier)	6
Isolated site	4
Guard and barrier	2
24-hour surveillance	0

Status of Property 5 (32)

Non-DoD control	5
Scheduled for transfer from DoD control	3
DoD control	0

Receptors

Population Density (people/sq mi) 5 (32)

> 500	5
100 - 500	3
< 100	1

Population near Hazard 5 (34)

26 or more buildings	5
16 to 25	4
11 to 15	3
6 to 10	2
1 to 5	1
0	0

Types of Activities/Buildings 5 (34,35)

Residential, educational, etc.	5
Industrial, warehouse, etc.	4
Agricultural, forestry, subsistence	3
Recreation (hiking, hunting, etc.)	2
No known or recurring activities	1

Ecological or Cultural Resources 5 (36)

Ecological and Cultural	5
Ecological	3
Cultural	3
None	0

- Evaluation Pending
- No Longer Required
- No Known or Suspected CWM Hazard

Number in () is page number with definition

CHE Definitions – CWM Hazard

- CWM Configuration
  - **Chemical, explosive configuration (used or damaged)** — Any explosively configured munition containing chemical warfare materiel filler that has been used or damaged (includes items damaged through ineffective treatment (e.g., explosive or thermal treatments))
  - **CWM mixed with UXO** — Any chemical warfare materiel that is co-mingled with UXO
  - **Chemical, explosive configuration (unused)** — Any explosively configured munition containing chemical warfare materiel filler that has not been used
  - **Bulk CWM (containerized or in a non-explosively configured munition)** — Chemical warfare materiel in a non-explosively configured munition, or chemical warfare materiel in a container, excluding chemical agent identification sets (CAIS) except:
    - K941: toxic gas set, M-1
    - K942: toxic gas set, M-2/E11
  - **Chemical Agent Identification Set (CAIS)** - Small quantities (vials) of pure or diluted chemical agents or industrial chemicals used in training, excluding K941 and K942 (listed above)
  - **Evidence of no CWM** – The site has no physical evidence of CWM nor historical (e.g., written documentation, interview results) evidence indicating that CWM are present

CHE Definitions – CWM Hazard

- Sources of CWM
  - **Live-fire with agent filler** — A range or other activity that supported live-fired agent-filled munitions
  - **Burial site with unused CWM munitions, damaged** — A burial of CWM items that have been damaged through ineffective treatment (e.g., explosive or thermal treatments)
  - **Discarded or abandoned CWM munitions, surface** – CWM that have been discarded or abandoned and are on the surface or exposed, in part or whole.
  - **Burial site with unused CWM munitions, undamaged** — A burial of CWM munitions that have not been damaged
  - **Production facility** — Facilities that are involved in the manufacture of CWM items
  - **RDT&E (Research, Development, Testing, and Evaluation)**
    - **Research facility** — A facility that was involved in the RDT&E activities that did not involve live-fire of CWM items for evaluation of performance
    - **Static testing** — Any activity that evaluated CWM items by causing them to function on a static test pad (non-live fire)
  - **Individual soldier training**
    - **Liquid agent training** — Training activities that involved the use of non-explosively configured CWM, primarily using CAIS
    - **Decontamination training** — Training of soldiers in decontamination practices using agent contaminated property
  - **Storage of CWM** — Any storage facility or structure
  - **Transfer operations** — Temporary storage facilities involved in the shipping of materiel
  - **Evidence of no CWM** – Following investigation, the site has no physical evidence of CWM, nor historical (e.g., written documentation, interview results) evidence indicating that CWM are present.

CHE Definitions – Accessibility

- Location of CWM
  - **Confirmed surface** — Physical presence or a confirmed incident report or accident report of CWM on the surface or exposed, in part or whole. (CWM exposed in part or whole by daily tidal changes should be considered as confirmed surface CWM.)
  - **Confirmed subsurface, active** —
    - Physical evidence or geophysical site-characterization data indicating that subsurface CWM or fully submerged (in less than 120 feet of water) CWM exist at the site; or a confirmed incident report or accident report accident report of CWM that have been exposed by known intrusive activities.
    - Active indicates that the site's geological conditions are likely to cause CWM to be exposed in the future by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave) or that on-going intrusive activities (e.g., plowing, construction, commercial fishing) are likely to expose CWM.
  - **Confirmed subsurface, stable** —
    - Physical evidence or geophysical site-characterization data indicating that subsurface CWM or fully submerged (in less than 120 feet of water) CWM exist at the site; or a confirmed incident report or accident report indicating that CWM that have been exposed by known intrusive activities.
    - Stable indicates that the site's geological conditions are not likely to cause CWM to be exposed by naturally occurring phenomena, or that intrusive activities are not likely to either occur, or to cause CWM to be exposed.
  - **Suspected (physical evidence)** - Physical evidence (e.g., CWM components), other than the physical presence of a CWM, that suggests the presence of CWM.

CHE Definitions – Accessibility

- Location of CWM

  - **Suspected (historical evidence)** - Any historical (e.g., written documentation, interview results) evidence (includes records on the use of a range or OB/OD area or unconfirmed evidence of buried CWM) indicating that CWM may have been used, discarded, or treated at the site. Does not include evidence that CWM were merely present at the site (e.g., stored or handled) at the site.
  - **Subsurface, physical constraint** — Evidence that subsurface or fully submerged CWM may exist, but that they cannot be accessed due to a physical constraint (e.g, pavement, water depth over 120 feet)
  - **Evidence of no CWM** – Following investigation, the site has no physical evidence (e.g., CWM components or constituents) of CWM, nor any historical (e.g., written documentation, interview results) evidence indicating that CWM are present.

CHE Definitions – Accessibility

- Ease of Access
  - **No barrier** — No physical means of controlling access or entry to site
  - **Barrier is incomplete** — Barrier does not completely surround the site or is in disrepair. Such areas would include water areas with restrictions annotated on government nautical charts that are without signage indicating access restrictions (e.g., water restrictions)
  - **Barrier (no guard) or guard (no barrier)** — A barrier is in place, but no manned entry controls
    (e.g., security guards or surveillance systems) are employed, or areas at which manned entry controls are employed, but no barrier is in place. Such areas would include water areas (e.g., lakes, rivers, bays, oceans etc.) with water restrictions annoted on nautical maps and signage but no patrols or guards.
  - **Isolated site** — A site, with or without a barrier, where there is minimal access because the site is in a remote location with limited access
  - **Guard and barrier** — Manned entry controls and barriers are employed
  - **24-hour surveillance** — A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel continuously monitors and controls entry) and a means to control entry at all times through the gates or other entrances (e.g., an attendant, television monitors, locked entrances, or controlled roadway access to the area)

Barrier: means either natural obstacles (e.g., difficult terrain, dense vegetation, water) or man-made obstacles (e.g., fencing) that prevent easy access to the area or entry to the site

CHE Definitions – Accessibility

- Property status
  - **Non-DoD control** — Site is not owned or managed by a DoD. (Examples include: Indian lands, land managed by other Federal agencies, state lands, privately owned land)
  - **Scheduled for transfer from DoD control** – DoD property that DoD plans to transfer to non-DoD control within 3 years
  - **DoD control** — Site is owned or managed by DoD or a State National Guard on a 24 hour a day basis

CHE Definitions – Receptors

- Population density
  - The population density (people/square mile) is calculated using the U.S. Census Bureau's latest data for the county population. The county area is expressed in square miles. If the site is located in more than one county, the largest population density is used. If the site is within or borders on city limits, the population density of the city should be used instead of the county population density
- Population near hazard (inhabited buildings within a 2-mile radius)
  - The population near the hazard is considered by counting the number of inhabited buildings within a 2-mile radius, extending out from the boundary of the munitions response site.
- Types of activities/buildings
  - **Residential, educational, etc.** — Inhabited buildings and activities within a 2-mile radius of the boundary of the military munitions response area or site are used for any of the following: residential, educational, child care, hospitals, hotels, commercial, shopping centers, play grounds, community gathering areas, religious sites, or critical assets (e.g., fire and rescue, police stations, dams).
  - **Industrial, warehousing, etc.** — Buildings or activities within a 2-mile radius of the boundary of the military munitions response area or site are used for industrial or warehousing purposes.
  - **Agricultural, forestry, substinence** — Buildings, land masses, or activities within a 2-mile radius of the boundary of the military munitions response area or site are used for agriculture, forestry, or subsistence hunting, fishing, or gathering.

Inhabited Buildings — Structures (e.g., schools, churches, residences, aircraft passenger terminals, stores, shops, factories, hospitals, theaters, etc.), other than operational DoD munitions-related buildings, routinely occupied for any portion of the day, both within and outside DoD establishments.

CHE Definitions – Receptors

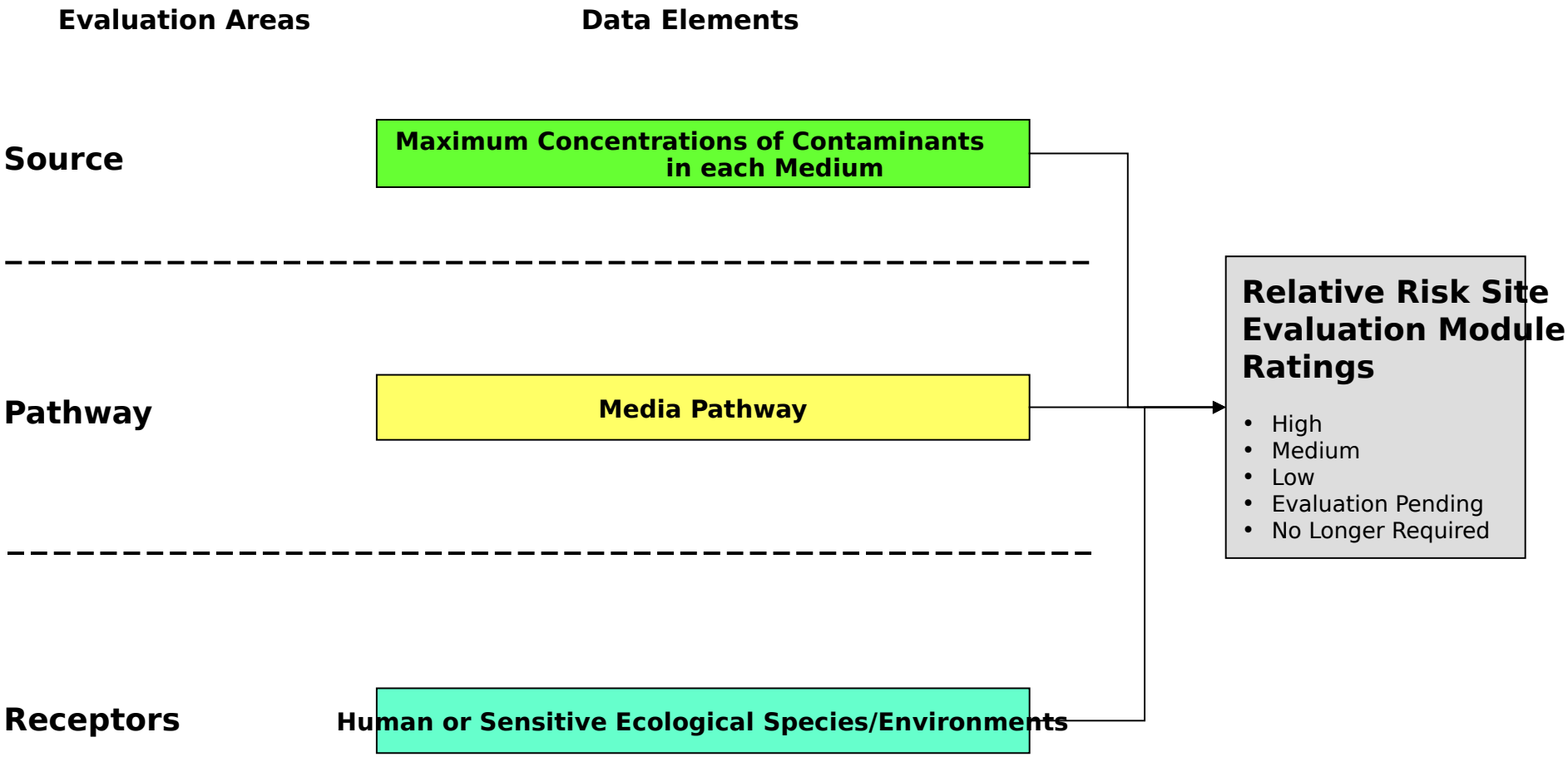
- **Recreational or thoroughfare (e.g., hiking, hunting)** —Buildings, land masses, or activities within a 2-mile radius of the boundary of the military munitions response area or site are used for recreational purposes, such as hiking, boating, or hunting or are used as thoroughfares.
- **No known or recurring activities** —There are no inhabited buildings within a 2-mile distance, extending out from the boundary of the military munitions response area or site.

CHE Definitions – Receptors

- Ecological and Cultural Resources
  - **Ecological resources** – Includes:
    - **Threatened and endangered species/critical habitat** – A recognized threatened or endangered species is present or the site is designated as critical habitat for such a species
    - **Sensitive ecosystems** – e.g., wetland, breeding grounds
    - **Natural resources** – Recognized and identified natural (e.g., mineral deposits) resources
  - **Cultural resources** – Recognized cultural, religious, and historical sites (includes Native American religious sites and areas used for subsistence)

Relative Risk Site Evaluation Module

Relative Risk Site Evaluation (RRSE)



Relative Risk Site Evaluation (RRSE)

Concentration of Contaminant

- Significant: CHF > 100
- Moderate: 2 - 100
- Minimal: CHF < 2

Media Pathway

- Evident
- Potential
- Confined

Human or Sensitive Ecological Species/ Environments

- Identified
- Potential
- Limited

Combing the three factors of RRSE

Contaminant Hazard Factor		Receptor Factor	Migration Pathway Factor: Evident	Migration Pathway Factor: Potential	Migration Pathway Factor: Confined
	Significant	Identified	High	High	Medium
		Potential	High	High	Medium
		Limited	Medium	Medium	Low
	Moderate	Identified	High	High	Low
		Potential	High	Medium	Low
		Limited	Medium	Low	Low
	Minimal	Identified	High	Medium	Low
		Potential	Medium	Low	Low
		Limited	Low	Low	Low

RRSE Module Ratings

- High
- Medium
- Low
- Evaluation Pending
- No Longer Required

RRSE Definitions

- Maximum Concentrations of Contaminants in each Medium
  - **Significant** — Sum of ratios (maximum concentration/comparison value) is greater than 100
  - **Moderate** — Sum of ratios (maximum concentration/comparison value) is 2 to 100
  - **Minimal** — Sum of ratios (maximum concentration/comparison value) is less than 2
- Media Pathway
  - **Evident** — Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure
  - **Potential** — Contamination in the media has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined
  - **Confined** — Low possibility for contamination in the media to be present at or migrate to a point of exposure
- Human or Sensitive Ecological Species/Environments
  - **Identified** — Identified receptors have access to contaminated media
  - **Potential** — Potential for receptors to have access to contaminated media
  - **Limited** — Little or no potential for receptors to have access to contaminated media

Combining the EHE, CHE, and RRSE

- Reaching the Site Priority

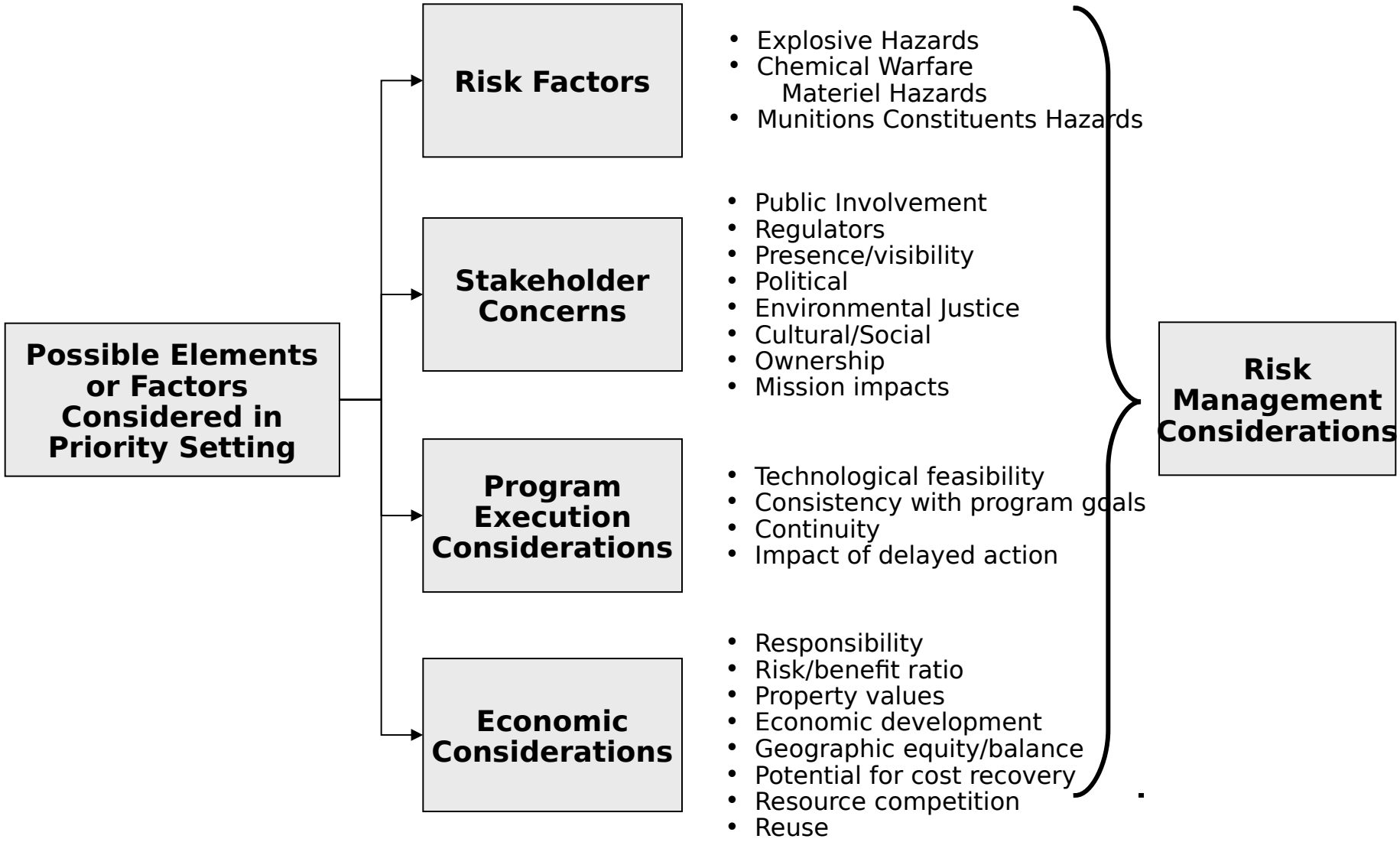
EHE, CHE, and RRSE Evaluations Combined

Select the highest priority (lowest number) among the three hazard evaluation modules

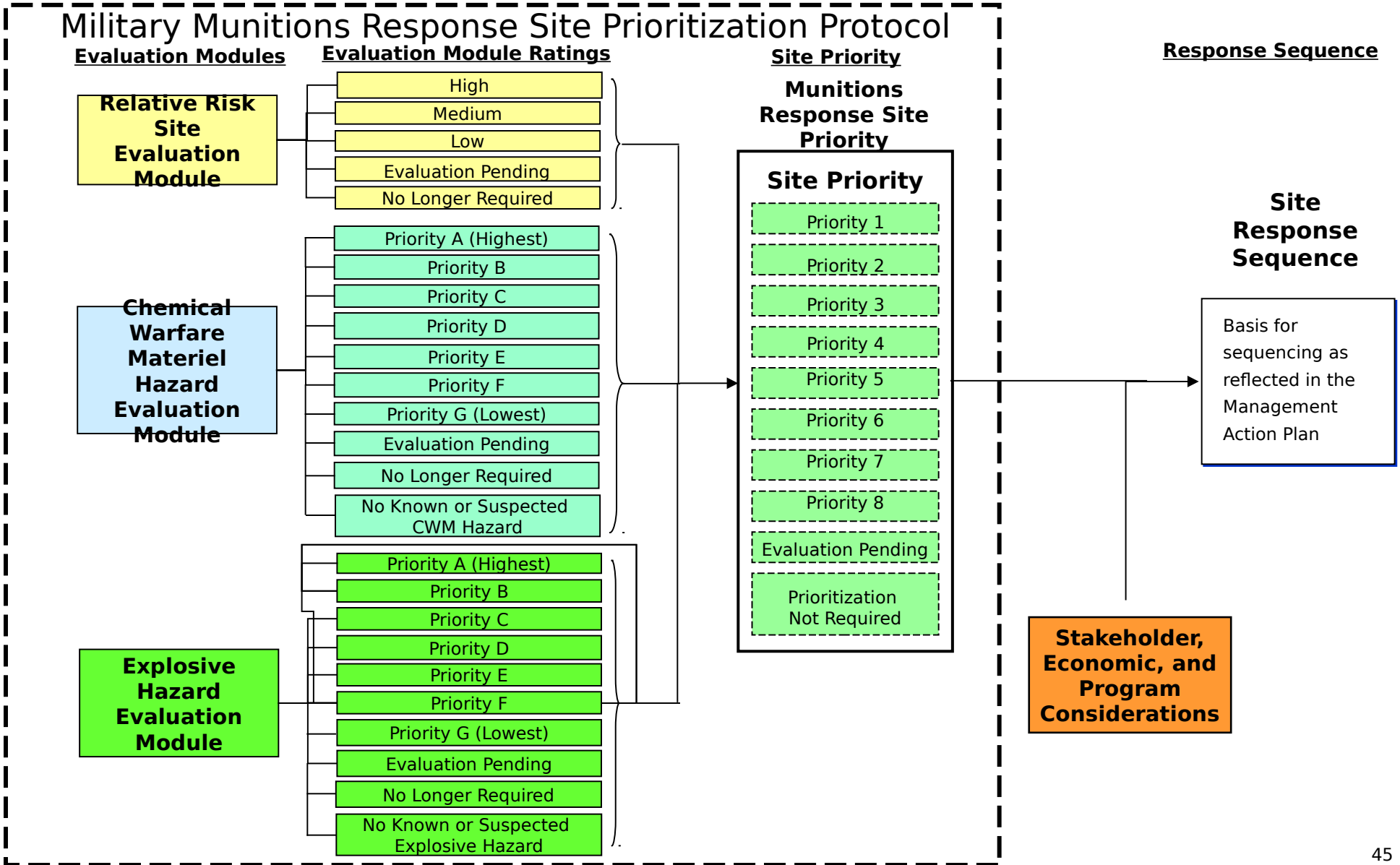
Explosive Hazard Evaluation Module		CWM Hazard Evaluation Module		Relative Risk Site Evaluation Module	
• Priority A (Highest)	2	• Priority A (Highest)	1	• High	2
• Priority B	3	• Priority B	2		
• Priority C	4	• Priority C	3	• Medium	5
• Priority D	5	• Priority D	4		
• Priority E	6	• Priority E	5		
• Priority F	7	• Priority F	6	• Low	8
• Priority G (Lowest)	8	• Priority G (Lowest)	7		
• No Longer Required		• No Longer Required		• No Longer Required	
• Evaluation Pending		• Evaluation Pending		• Evaluation Pending	
• No Known or					

Other Considerations in Sequence Setting

Other Considerations' Role in Sequence Setting



Integration of Protocol with Other Stakeholder Considerations



Policy Decisions/Issues

- **Should the protocol be applied to munitions response sites and/or areas?**
- **When should the protocol be applied to sites?**
- **Can we assign a priority to a site when data are sufficient to run at least one of the three modules?**
- **Who will apply the protocol?**
- **Who should be trained on the protocol?**
- **By what date should Components complete prioritization of all sites?**
- **Under what circumstances should the protocol be reapplied?**
  - **new information is available,**
  - **area is further delineated and characterized, or**
  - **response action that has reduced hazard has been conducted**

Feedback

- **Comments, questions, concerns?**
  - **Please Contact:**

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